

Chinese Women in Physics

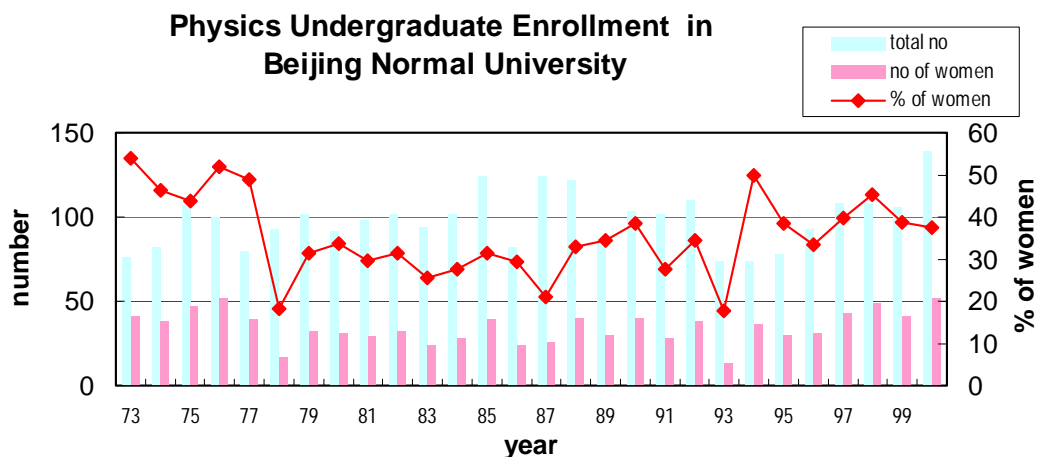
Ling-An Wu

*Institute of Physics, Chinese Academy of Sciences
Beijing 100080, China*

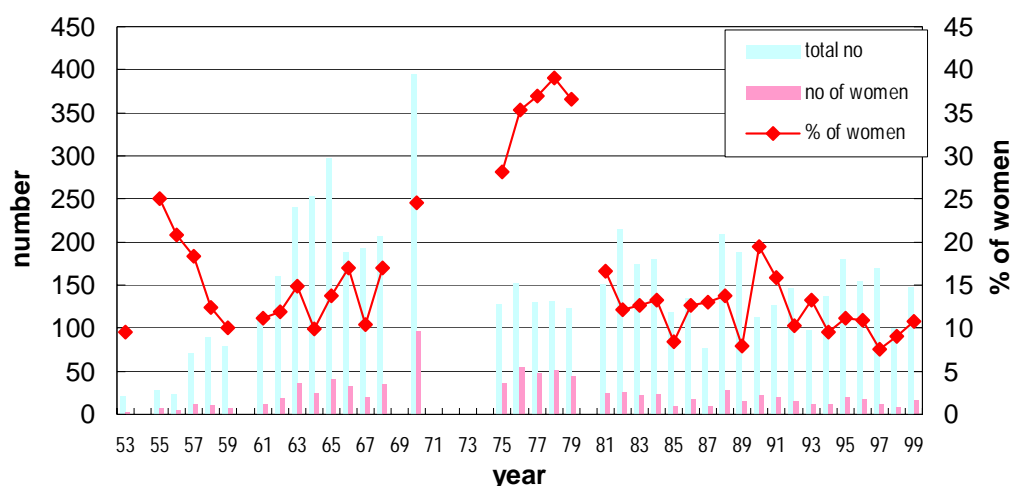
Although it is well known that the magnetic compass, rockets and other technologies were first invented in China, physics only began to develop as a science here in the early 20th century. Despite the social and political upheavals of that century, physics education and research managed to survive and indeed, flourish. The Chinese Physical Society was established in 1932, even as the country was under the yoke of foreign invasion, and it was precisely during this period that a young Chinese woman was receiving her college education, Chien-Shiung Wu, who was to become the first woman president of the American Physical Society. Other women followed in her footsteps, continuing their education in the US and Europe since most universities were disrupted by the war, but many returned and later played prominent roles in building the physics infrastructure after peace returned to China. The earlier pioneers were involved in nuclear physics, reflecting the interest of their times, but others turned to solid state physics, including Xi-De Xie who, in the mid-eighties, was president of Fudan University, one of the major universities of China.

In the fifties the universities underwent a major reshuffle with strong emphasis on science and technology, and China embarked on an ambitious plan to train new generations of scientists and engineers to meet the demands of a modern socialist society. Women were further emancipated, enjoying equal rights and equal pay as men, with even special benefits such as maternity leave. Enrollment of women in schools increased at an unprecedented rate in history, especially enrollment of women in the sciences, and in certain fields such as medicine rivaled that of men.

However, physics has only seen a moderate rise, and the reason is by no means simple. In certain normal universities the proportion of female to male students has been as high as one third, but in the top ranked comprehensive and science and engineering universities the number has seldom exceeded 20%. It seems impossible to give an explanation just by looking at the statistics, which is illustrated in the figures for Beijing Normal University and Nanjing University.



Physics Undergraduate Enrollment in Nanjing University

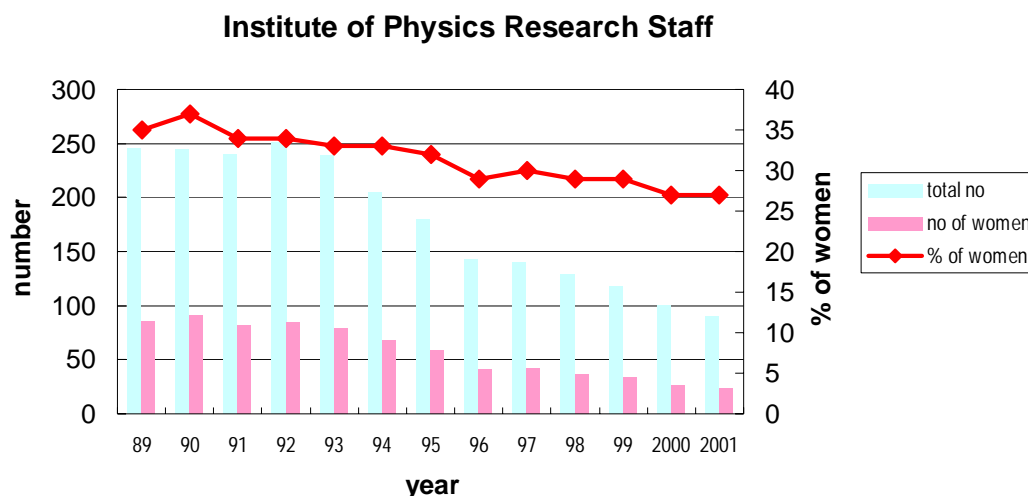


We see that the ratio of women students as a function of year over the last decades appears to be totally chaotic. This is because the enrollment number is a variable of social, political and economic factors, all of which underwent and are still going through major changes in China.

Formerly, the quota for physics departments in universities was entirely determined by the state, and enrollment was strictly based on examination performance. Then, during the latter years of the 'cultural revolution', after university education resumed the students were recruited in part by recommendation based on work performance. Since girls tended to be more docile than boys they won more approval from the authorities concerned, which explains the sudden peak in the ratio of women in physics departments in those years. In the eighties, national college entrance examinations were resumed, and then after the 'opening up' of China to the outside world, external factors became a strong influence. The CUSPEA program initiated by Nobel prize winner T. D. Lee encouraged young students, boys and girls, to choose physics so that they could compete purely on the basis of scholarship to go abroad and study for a PhD in the USA. China's participation in the International Physics Olympiad further enhanced this enthusiasm. But the ratio of women has not drastically increased, and in fact in some universities has decreased compared with pre-cultural revolution days. This may be explained in part by the emergence of new disciplines such as computer science and environmental science, as well as the revival of departments such as law, economics and finance, which have attracted a large proportion of women.

As is commonly found, although the situation in China is better than in many other countries, the ratio of women who remain in physics after college decreases with every step up in rank, and the ratio of women in the highest rank (equivalent of full professor) has never exceeded 10%. It is significant also that about 30% of the teachers of high school physics are female, and the total proportion of women in the physics faculty of some universities is now higher than 30%. However, the number of women in research institutes is rapidly going down, due to the impending retirement of a previous generation of women physicists with no new recruitment in sight. This can be seen from the statistics of the Institute of Physics of the Chinese Academy of Sciences. Recent figures from the National Natural Science Foundation of China

shows that the percentage of women awarded research grants was around 11.7% for the age bracket above 40 years but about 5.4% for that below.



The outlook for women in physics professions in China is also disquieting for other reasons. Ostensibly there is still equal pay and equal opportunities for women, but many companies and institutions are now openly though not legally stating preference for male employees. Moreover, there is now an official preference for young people when considering promotion or funding, which in fact implies discrimination since it makes it harder for women to return to a physics career after the years spent on child bearing and family duties. Due to economic reasons many day care centres have been abolished, and the return of a certain degree of unemployment has even led to talk of letting the wife stay at home. Even male physicists have been heard to say there is no need to encourage women to take physics. This is particularly distressing as so many were taught physics by a female teacher in high school or college!

In the last two decades China has made impressive strides in modernization of the economy, developed on a solid foundation of science and technology built up over the years. In this, physics has and will always play an indispensable role, but in physics women have been the unsung heroines. It is imperative that, through appropriate policies, women should be allowed to give full play to their abilities in a career in physics and thus make their maximum contribution to this supreme science.